



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA 35898-5000

17 DEC 1999

AMSAM-RD-AE-I (70-37a)

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Airworthiness Release for Emergency Locator
Transmitter (ELT) Installation and Testing Procedures on All
U.S. Army Aircraft Incorporating ELTs

1. References:

- a. Search and Rescue (SAR) Manual, FM 20-150.
- b. Emergency Locator Transmitter Installation Instructions
(Encl 1).
- c. Emergency Locator Transmitter Electromagnetic
Interference/Electromagnetic Compatibility (EMI/EMC) Testing
Instructions (Encl 2).
- d. Emergency Locator Transmitter Check Procedures
(Encl 3).
- e. Emergency Locator Transmitter Manufacturer Data Sheets
(Encl 4).

2. This memorandum constitutes an Airworthiness Release (AWR) in accordance with (IAW) Army Regulation (AR) 70-62 to authorize operation of U.S. Army aircraft with Emergency Locator Transmitters (ELTs) as described in reference 1b. Only those ELTs associated with and described in reference 1b are authorized. Emergency Locator Transmitters not installed per this release or ELTs of a different configuration not described in this release require approval from the U.S. Army Aviation and Missile Command (USAAMCOM), Aviation Engineering Directorate. This is an Airworthiness Release and has not been transmitted to units subordinate to addressees. Addressees should immediately retransmit this message to all subordinate units, activities or elements affected or concerned.

3. Configuration: The U.S. Army aircraft are defined per their applicable Operator's Manual, to include all changes, and Interim Statements of Airworthiness Qualification (ISAQs).

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NOTE

This AWR is temporary and does not render invalid any other AWRs currently covering the subject aircraft indicated. Any interference (physical or operational) between this installation and other installations shall be reported prior to flight to the respective point of contact identified in paragraph 8, at Headquarters, U.S. Army Aviation and Missile Command.

CAUTION

Any deviation from installation instructions as stated herein, is not authorized. Any deviation from installation instructions shall void this AWR.

4. Operations and Restrictions:

a. The aircraft shall be operated IAW the respective Operator's Manual and this document. In the event of conflict between the Operator's Manual and this document, the information in this AWR shall prevail.

WARNING

The EBC 302HM and 502HM ELTs as well as the ARTEX 100HM ELT incorporate a light that indicate when the ELTs are in the "OFF/TEST" position. The suitability of these lights for use with night vision goggles (NVG) is unknown. Pilots utilizing NVG must be aware that the ELT indicator light may degrade NVG vision if the switch is placed in the "OFF/TEST" position or if the ELT automatically activates during an abrupt, in-flight maneuver.

WARNING

The orange color of the ARTEX ELT-100HM has not been tested to ensure non-infrared reflective finish during night vision goggle operations. Pilots utilizing NVGs must be aware that the the reflectivity of the orange colored ELT may degrade NVG vision in the cockpit.

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WARNING

For aircraft using the EBC 502HM ELT, the audible monitor must be removed or disabled prior to ELT installation to preclude pilot confusion in an emergency. The audible monitor may negatively impact the message clarity of the aircraft audio warning system to the pilot should the EBC 502HM activate in flight during an emergency situation.

b. Specific ELTs shall be operated per applicable FAA and FCC regulations and per information and instructions provided in reference 1e Manufacturers Data Sheets.

c. The following functional test is recommended before every flight, however, as a minimum must be performed every 100 flight hours or three months, whichever comes first.

(1) The Federal Aviation Administration (FAA) allows free space transmission tests from the aircraft any time within five minutes after each hour. The test time allowed is generally two sweeps of the warble tone, or approximately a one second test. The control tower should be notified that a test will be performed.

(2) Set the aircraft transceiver to 121.5 MHz and turn the ELT transmitter switch to ON. The transmitter will be heard immediately.

d. After the functional test is completed, reset the ELT Transmitter switch as follows:

(1) For the Emergency Beacon Corporation and Dorne Margolin ELTs, first toggle the switch to OFF/TEST and then to the AUTO/ARM position.

(2) For the ARTEX ELT, toggle the switch to the OFF position.

e. A weight and balance form must be executed or be on file per Army Regulation (AR) 95-1.

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5. Special Inspections and Instructions:

WARNING

Do not paint the externally mounted rigid antennas supplied with the ARTEX and Dorne Margolin ELTs. The externally mounted, rigid antennas are manufactured, painted, and tuned to emit a signal at a specific frequency. Painting the antenna will de-tune the antenna and may cause the ELT signal to not be received by tracking satellites.

a. U.S. Army aircraft utilizing ELTs are required to follow the installation procedures IAW reference 1b using only the equipment defined within this reference.

b. Parts needed for this modification may not be available in the supply system. Your activity/facility must locally procure/manufacture the modification parts (plus any additional spare parts). This Airworthiness Release is not authorization for "Sole Source" procurement of any material or services. This Command has no responsibility for establishing or maintaining any logistics support for the nonstandard equipment or system installation. Any/all logistics support required to be provided for such equipment/system installation must be established and maintained by the operating unit with appropriate, locally established, support activities.

c. A qualitative EMI/EMC test of ELTs shall be conducted IAW reference 1c prior to first flight of the newly installed ELT to demonstrate that this equipment does not serve as sources or victims of EMI with existing electrical/electronic subsystems. This shall be accomplished by monitoring the performance of all new and existing subsystems, as individual subsystems are operated in-turn. Operation of equipment shall include a power-on/power-off cycle, initializing or warm-up, and all modes of operations. All equipment shall be in the "in-flight" configuration and powered using aircraft generated power. Ground EMI/EMC testing of the ELTs shall be accomplished one time on one of each configuration (model and equipment package) aircraft in each unit. All EMI/EMC test

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anomalies shall be reported by telephone to the respective USAAMCOM Aviation Engineering Office (see paragraph 8) prior to next flight. The aircraft shall not be considered airworthy unless the tests demonstrate that the newly installed equipment (including any test instrumentation) does not serve as sources (initiators) or recipients of electromagnetic interference. In addition to any phone report, a letter report confirming completion of EMC test will be submitted to the respective point of contact at Headquarters, U.S. Army Aviation and Missile Command, not more than 10 days after the test, stating that the EMC test was completed and referencing the applicable flight release.

d. An ELT check must be completed IAW reference 1d before each flight and before avionics shut-down. In addition to this check, a preflight visual inspection shall be made of the subject installation to ensure that no progressive structural deterioration is occurring, that there is no loss of security, that no battery leakage has occurred, and that no damage to the host aircraft exists. Any occurrence of the preceding shall be corrected prior to further flight operations.

e. Procedures for recognition of an activated ELT are detailed in reference 1d.

f. In the event any operating limit, or limits established by this release, is exceeded in addition to the normal entry on DA Form 2408-13, appropriate inspection plus special inspection for security and condition of modifications shall be performed prior to next flight. Any incident or malfunction of the aircraft suspected of being related to these configuration modifications shall be reported immediately to the respective USAAMCOM Aviation Engineering Office at Headquarters, U.S. Army Aviation and Missile Command.

g. This aircraft shall be returned to standard configuration prior to transfer or turn-in to an overhaul facility.

h. The aircraft shall be inspected and maintained IAW all applicable Maintenance Manuals and associated Maintenance Advisory and Safety-of-Flight Messages. Any discrepancies shall be evaluated/repared prior to the next flight to ensure continued airworthiness of the aircraft.

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i. Specific ELTs shall be maintained per information and instructions provided in reference 1e Manufacturers Data Sheets and the following:

(1) Inspect batteries every three months for leaks.

(2) For the Emergency Beacon Corporation Models 302HM and 502HM battery replacement, replace with Emergency Beacon battery pack. These ELTs are non-field repairable. For repair, send unit to Emergency Beacon Corporation, 15 River Street, New Rochelle, New York 10801, commercial phone (914) 235-9400.

(3) For Dorne Margolin (DM) 8.5 battery replacement, replace only with DM ELT 8.13 Battery Pack. This ELT is non-field repairable. For repair, send unit to Dorne Margolin Incorporated, 2950 Veterans Memorial Highway, Bohemia, New York 11716, commercial phone (516) 595-5396.

(4) For ARTEX battery replacement, replace with six 1.5 volt direct current (dc) "D" size alkaline Manganese Dioxide cells connected in series. This ELT is non-field repairable. For repair, send unit to ARTEX Aircraft Supplies Incorporated, 107714 South Township Road, Canby, Oregon 97013, commercial phone (503) 266-3959.

j. Upon completion of this installation, and with all the transmitter mounting hardware installed operate the collective and cyclic controls through their maximum range of travel and assure the hardware does not interfere with movement of flight controls system. If the flight controls were disturbed then a complete flight controls rigging must be performed.

6. Aircraft Logbook Entries:

a. In the absence of ELT installation and/or EMI/EMC checklist from USAAMCOM for other U.S. Army aircraft and/or ELTs not included in reference 1b and/or 1c, the following procedures shall be followed:

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(1) Installation Instructions: Contact the respective aircraft engineering office at USAAMCOM (see paragraph 8), indicate the type of ELT to be installed, and request an Airworthiness Release from USAAMCOM detailing ELT installation procedure.

(2) Electromagnetic Interference/Electromagnetic Compatibility Checklist: Contact the Mission Equipment Office at USAAMCOM (see paragraph 8), indicate the type of aircraft and ELT requiring EMI/EMC checklist, and request an ELT EMI/EMC checklist.

b. In accordance with Department of the Army (DA) Pamphlet (PAM) 738-751, the following entries shall be made on the DA Form 2408-13-1/2408-13-1-E and shall be perpetuated on each form during the period of installation or until superseded by another airworthiness release, or until reason for limitation is removed.

c. DA Form 2408-13-1 and 2408-13-1E shall be annotated IAW this Airworthiness Release as follows:

Block 16

Circled Red "X "

Red Horizontal Dash

Block 17

EMC Test Flight required prior to the next flight IAW this Airworthiness Release dated _____.

Scheduled maintenance inspection, special inspection, component/module replacement, maintenance operational check is required. Perform special inspections required IAW this Airworthiness Release dated _____.

Per DA PAM 738-751, paragraph 1-8.a.(2)(b) and 1-9.a., the above Circled Red "X" test flight entry shall be cleared upon completion of the test flight and is **required for the UH-60 only**. Once the Circled Red "X" test flight entry is cleared, the UH-60 logbook shall incorporate the Red Horizontal Dash above to include the

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scheduled maintenance inspections in the Fault/Remarks section. The **Red Dash** inspection entry is **required for all aircraft** and shall be cleared upon return of aircraft to standard configuration. It is acceptable for the local Commander or Maintenance Officer to assume responsibility for the **Red Dash** inspection entry by means other than the logbook entry (i.e., Aviator's Information File with quarterly review). The remaining blocks in the Fault Information Block will be completed per DA PAM 738-751. After the description of the write-up entries, insert "For DA Form 1352 reporting purposes, the above write-ups shall not cause the aircraft to be reported as Partially Mission Capable (PMC). Aircraft which are nonstandard configured and operating under this release may be reported as Fully Mission Capable (FMC)."

d. The Fault Status section of DA Form 2408-13-1 shall be adjusted when appropriate.

e. DA Form 2408-15, Historical record for Aircraft shall be utilized.

f. DA Form 2408-17, Aircraft Inventory Record shall be utilized.

g. DA Form 2408-18, Equipment Inspection List shall be utilized.

h. DA Form 2408-23 Survival Radio/ELT Inspection Record shall be utilized.

i. An exact copy of this Airworthiness Release with applicable enclosures shall be inserted in the aircraft logbook and another copy inserted in the Aircraft Historical Record File. The DA Form 2408-15 shall be annotated to indicate the issuance of this Airworthiness Release.

7. The Airworthiness Release is terminated upon transfer of the aircraft, changes in configuration of the subject equipment, or upon issuance of a later Airworthiness Release that incorporates the subject equipment, whichever occurs first.

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8. For questions concerning this Airworthiness Release, contact Mr. Tim Rickmeyer, AMSAM-RD-AE-I-P-C, DSN 897-4808 or commercial (256) 313-4808, or Mr. Lon A. Stanger, AMSAM-RD-AE-I-P-A, DSN 897-4920 or commercial (256) 313-4920. Other USAAMCOM points of contact are:

<u>AIRCRAFT</u>	<u>POINT OF CONTACT</u>	<u>DSN</u>	<u>COMMERCIAL</u>
A/MH-6	Mr. Jesse Gambee	897-4811	(256) 313-4811.
OH-58A/C	Mr. Skip Jackson	645-9625	(256) 955-9625.
OH-58D	Mr. Eugene Mergel	788-0973	(256) 842-0973.
AH-1	Ms. Denise Bouchard	645-9736	(256) 955-9736.
AH-64A	Mr. Ananta Tosh	897-4805	(256) 313-4805.
UH-1	Mr. Steve Monaco	645-0078	(256) 955-0078.
EH/UH-60	Mr. Jay Merkel	645-0750	(256) 955-0750.
CH-47	Mr. Larry Wieschhaus	897-3341	(256) 313-3341.
Fixed Wing	Mr. Paul Lutz	645-0841	(256) 955-0841.
Safety	Mr. Robert D. Brock	788-8632	(256) 842-8632.
Mission	Mr. Lewis Williams	897-4867	(256) 313-4867.
Equipment			

4 Encls
as


BARRY J. BASKETT
Director of Aviation Engineering

SUBJECT: Airworthiness Release for Emergency Locator Transmitter
(ELT) Installation and Testing Procedures on All U.S. Army Aircraft
Incorporating ELTs

DISTRIBUTION:

Commander, U.S. Army Materiel Command, ATTN: AMCL6-RS-AVN,
5001 Eisenhower Avenue, Alexandria VA 22333-0001
Commander, Headquarters, USAMC Europe, ATTN:
AMXEU-M-R-TMM-MDT, APO AE 09266
Commander, Training and Doctrine Command, ATTN:
ATPL-V-MM/ATCD-B/ATBO-HM, Fort Monroe, VA 23651-5000
Commander, U.S. Army Aviation Center, ATTN:
ATZQ-DI/ATZQ-DOL/ATZQ-ES, Fort Rucker, AL 36362-5000
Commander, Eighth United States Army, ATTN:
EAGC-EA/EAGD-MS-M-A/DJ-MS-AV, APO AP 96205
Commander-in-Chief, U.S. Army Europe, ATTN:
AEAGC-AV/AEAGD-SM-AV, APO AE 09014
Commander-in-Chief Europe, ATTN: ECJ3-IAV, APO AE 09131
Commander-in-Chief, U.S. Army Europe, ATTN:
ADCSLOG-MRM/AEAGD-MMC-RS/AEAGD-SM-AV, APO AE 09014
Commander, U.S. Army Forces Command, ATTN:
FCJ4-SMM/FCJ4-OVS/AFOP-OV, Fort McPherson, GA 30330
Commander, U.S. Army Southern Command, ATTN:
SOBA-AV-AMO, APO AA 34001
Commander-in-Chief, U.S. Southern Command Headquarters, ATTN:
SCJ33-1, 3511 NW 91st Ave, Miami, FL 33172
Commander, U.S. Army Japan, ATTN: AJOA/APAJ-6D-SMD, APO AP
96343
Commander, U.S. Army Kwajalein Atoll, ATTN:
CSSF-H-KLT-KS/CSSF-KA-LA, APO AP 96555
Commander, 200th Theater Army Materiel Management Center,
ATTN: AERLA-MMC-ATD, Unit 23203, APO AE 09263
Pan Am World Services, Par 2, APO AP 96555
Chief, National Guard Bureau, ATTN: NBG-AVN-A, 111 South
George Mason Drive, Arlington, VA 22204-1382
Commander, 25th Infantry Division, ATTN: APVG-PT-AV/LGA-PA,
Schofield Barracks, HI 96857-5400
Commander, West Command, ATTN: APLG-MM/APOP-MV/APOP-TR-AV,
Fort Shafter, HI 96858
Commander, Army Reserve, Logistics Division, ATTN: DAAR-LO,
The Pentagon, Washington, DC 20310

ELT INSTALLATION INSTRUCTIONS

Enclosure 1

INSTALLATION INSTRUCTIONS FOR
AH-64A SERIES AIRCRAFT
EMERGENCY LOCATOR TRANSMITTER

1. PURPOSE: The purpose of these installation instructions is to provide the necessary information to enable users of AH-64A series aircraft to fabricate and install parts necessary to support Emergency Locator Transmitter (ELT) with its flexible antenna. An omni-directional actuated ELT is recommended for helicopter installations. Presently there are three ELT installations available. These instructions apply to the Electron Beacon Corporation Models 302HM and 502HM; and the ARTEX 100HM. Alteration of these instructions for ELT installation requires a submittal of request for deviation to HQ, USAAMCOM, ATTN: AMSAM-RD-AE-I-P-A.

2. AUTHORITY: This document does not constitute authority to implement. Funding for and authority to install an ELT in individual AH-64A series aircraft will be provided by the applicable major Army Command.

3. PARTS REQUIRED: The following parts are required to install the ELTs and shall be requisitioned and/or fabricated or procured as required:

a. For the non-preferred location (current) Emergency Beacon Corporation, EBC 302HM ELT and EBC 502HM ELT:

<u>QTY</u>	<u>NOMENCLATURE</u>	<u>P/N or NSN</u>
1	0.063" thick 2024 T-3 Alum. 1 square foot sheet	Stock
9	#5 solid rivet-countersunk	MS2426
1	Decal, Glareshield	9905-01-260-0745

b. For the preferred location Emergency Beacon Corporation, EBC 302HM ELT and EBC 502HM ELT use common hardware (1 1/2 inch screws with washers) to install.

c. For the ARTEX 100HM ELT use common hardware to install.

4. INSTALLATION INSTRUCTIONS:

a. The non-preferred location (current) EBC 302HM ELT and the EBC 502HM ELT will be installed on the inboard side of the Copilot/Gunner

Sensor Surveying Unit Mount Fairing P/N 7-311180080-17. Reference TM 1-1520-238-23P, Figure 222, Item 7 included herein as Sheet 1.

(1) The ELT contains a mounting bracket which contains three holes. Remove the bracket from the ELT. From the Copilot/Gunner's cockpit, detach the four fairing clip assemblies from the support tubes to allow free movement of the fairing. Next, remove the hinge pin from the fairing's hinge assembly and remove the fairing from the aircraft.

(2) Cut 2 each doublers to dimensions as shown in Sheet 2. Draw reference line on fairing as shown in Sheet 3. Align both doublers with reference line. Locate and drill/dimple 9 each holes using a #30 drill bit through both doublers, the fairing, and the ELT bracket at the same time (see Sheet 2 for hole locations).

(3) Cut holes in doublers to match existing hole in the fairing. Deburr and zinc chromate the aluminum doubler plates.

(4) Rivet the ELT bracket, aluminum doublers, and the fairing together using 5 countersunk rivets. Rivet the last four rivets in the corners of the doublers and fairing. Ensure the rivet heads on ELT bracket are flush with the ELT bracket and the ELT bracket is on the inboard side of the fairing. The bucked rivet end should be on the outboard side of the fairing and outboard doubler.

(5) Paint assembly black to match the color of the fairing.

(6) Apply decal in appropriate position.

(7) Reinstall the fairing onto the aircraft by inserting the hinge pin.

(8) Place the EBC 302HM or EBC 502HM ELT in the ELT bracket with the wand antenna on top. Ensure the switch is in the "ARM " position. Secure the fairing and ELT installation by snapping the four fairing clips onto the support tubes. Disconnect the crash force sensor shorting plug.

b. The preferred location of the EBC 320HM and 502HM ELTs will be on the pilot right hand Armored Wing Panel (see Sheet 4). Reference Figure 210/211 of TM 1-1520-238-23P Item 22/25. Picture references are shown in Sheets 5 and 6.

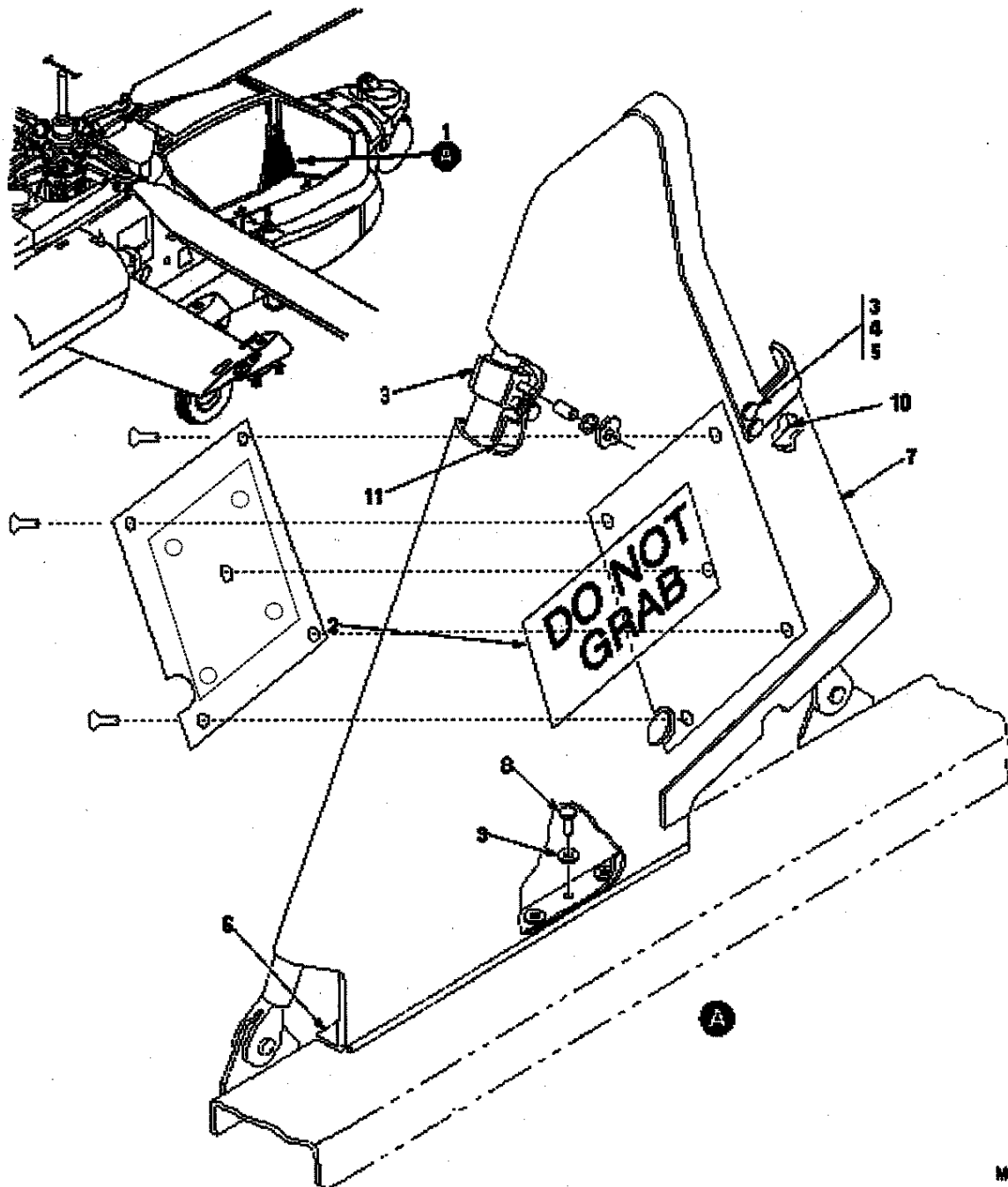
(1) The EBC 302HM and EBC 502HM ELTs contain a mounting bracket which contains three holes. Remove the bracket from the ELT. Using the bracket as a template, locate and drill 3 holes using general maintenance practices.

(2) Install the ELT bracket with 1 1/2 inch screws and washers. Place the EBC 302HM or 502HM ELT in the ELT bracket with the wand antenna on top. Ensure the switch is in the "ARM" position.

c. The location of the ARTEX 100HM ELT will be the same location as the preferred location of the EBC 302HM and EBC 502HM ELTs on the pilot right hand Armored Wing Panel (see Sheet 4). Reference Figure 210/211 of TM 1-1520-238-23P Item 22/25. Picture references are shown in Sheets 7 and 8.

(1) The ARTEX 100HM ELT contains a mounting bracket which contains four holes. Remove the bracket from the ELT. Using the bracket as a template, locate and drill 4 holes using general maintenance practices.

(2) Install the ELT bracket with 1 1/2 inch screws and washers. Place the ARTEX 100HM ELT in the ELT bracket with the wand antenna on top.



MOB-1110D

Figure 222. Group 02 Fairing Installation, Sensor Surveying Unit Mount (Copilot/Gunner)
7-311180080-17

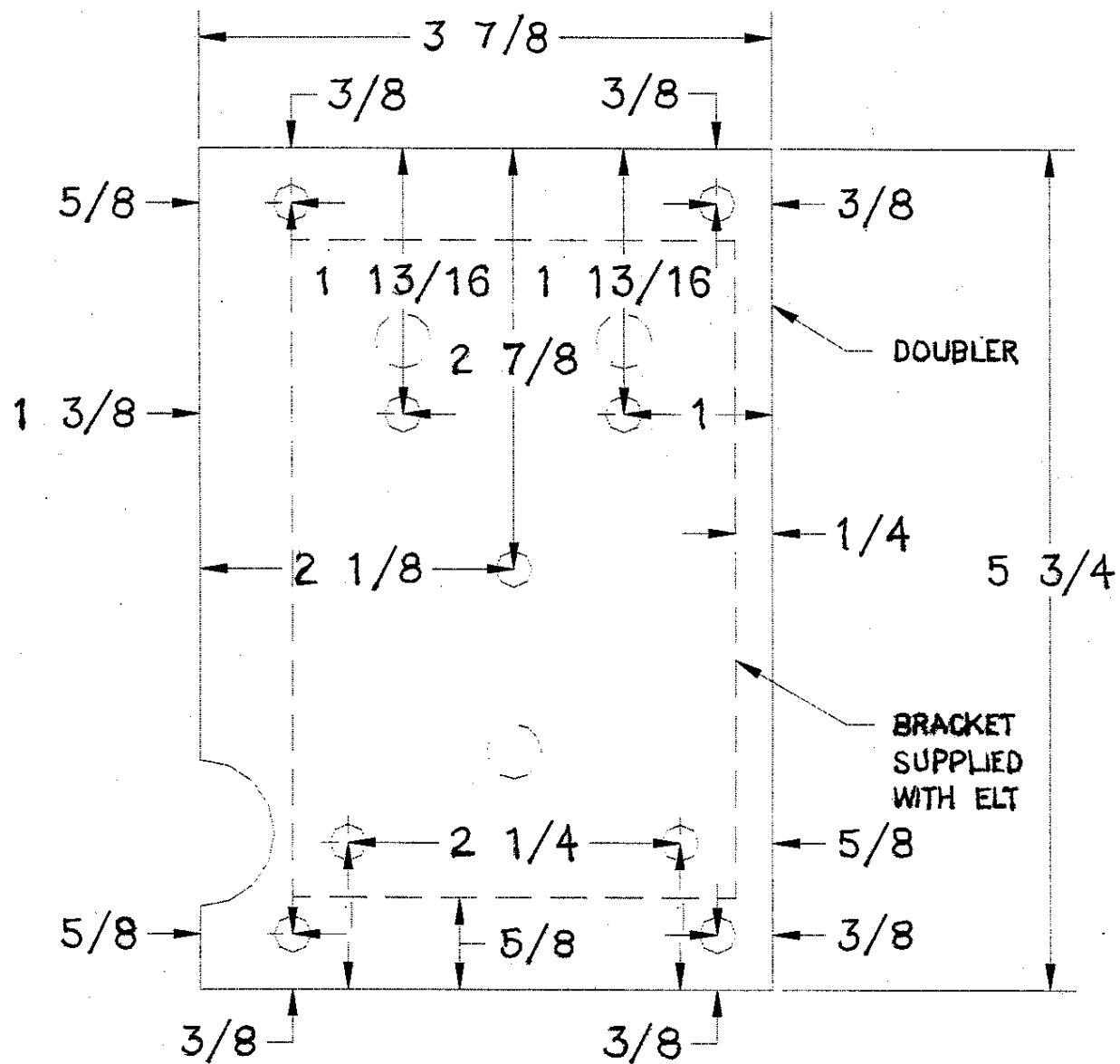


FIGURE 2

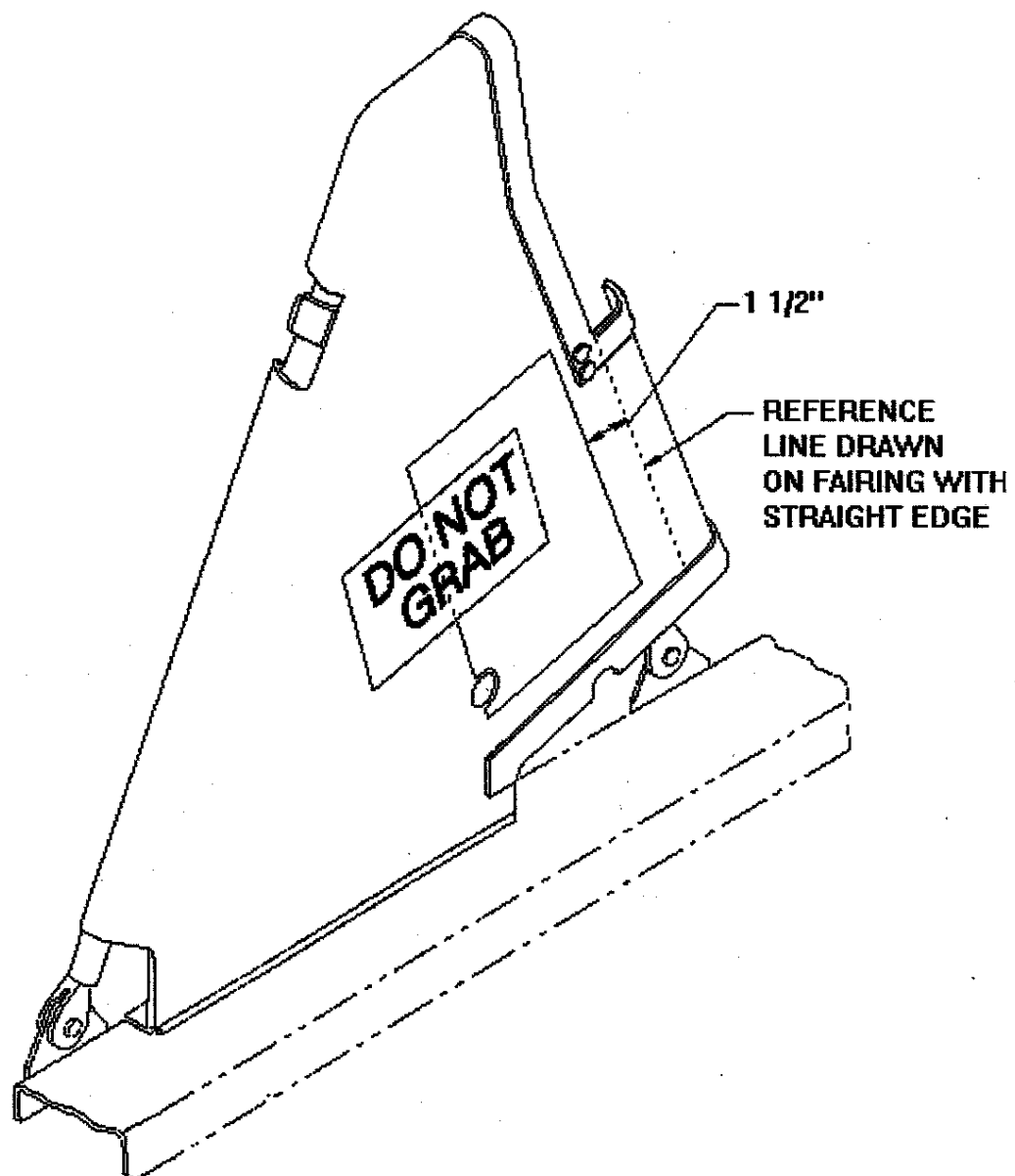
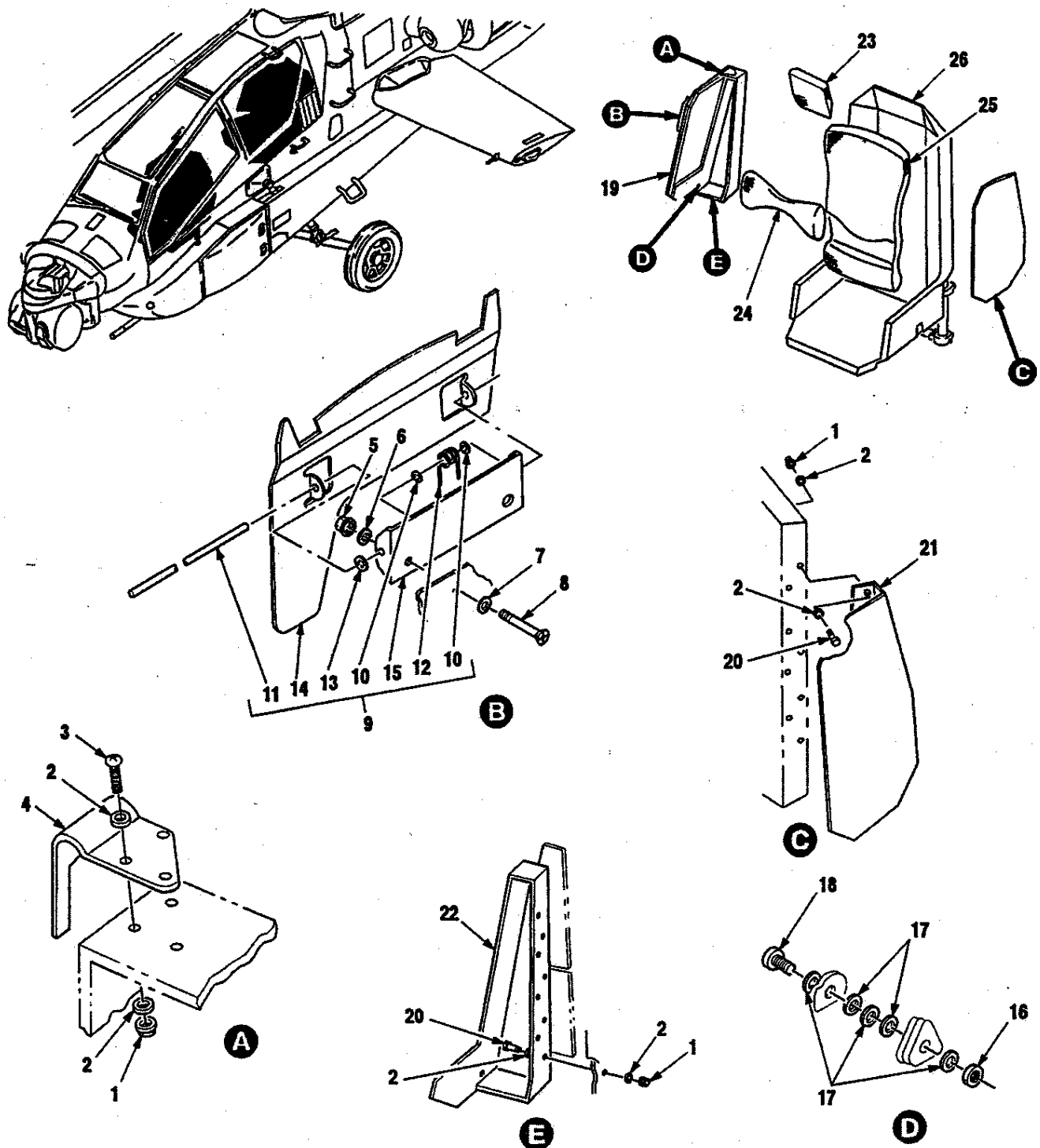
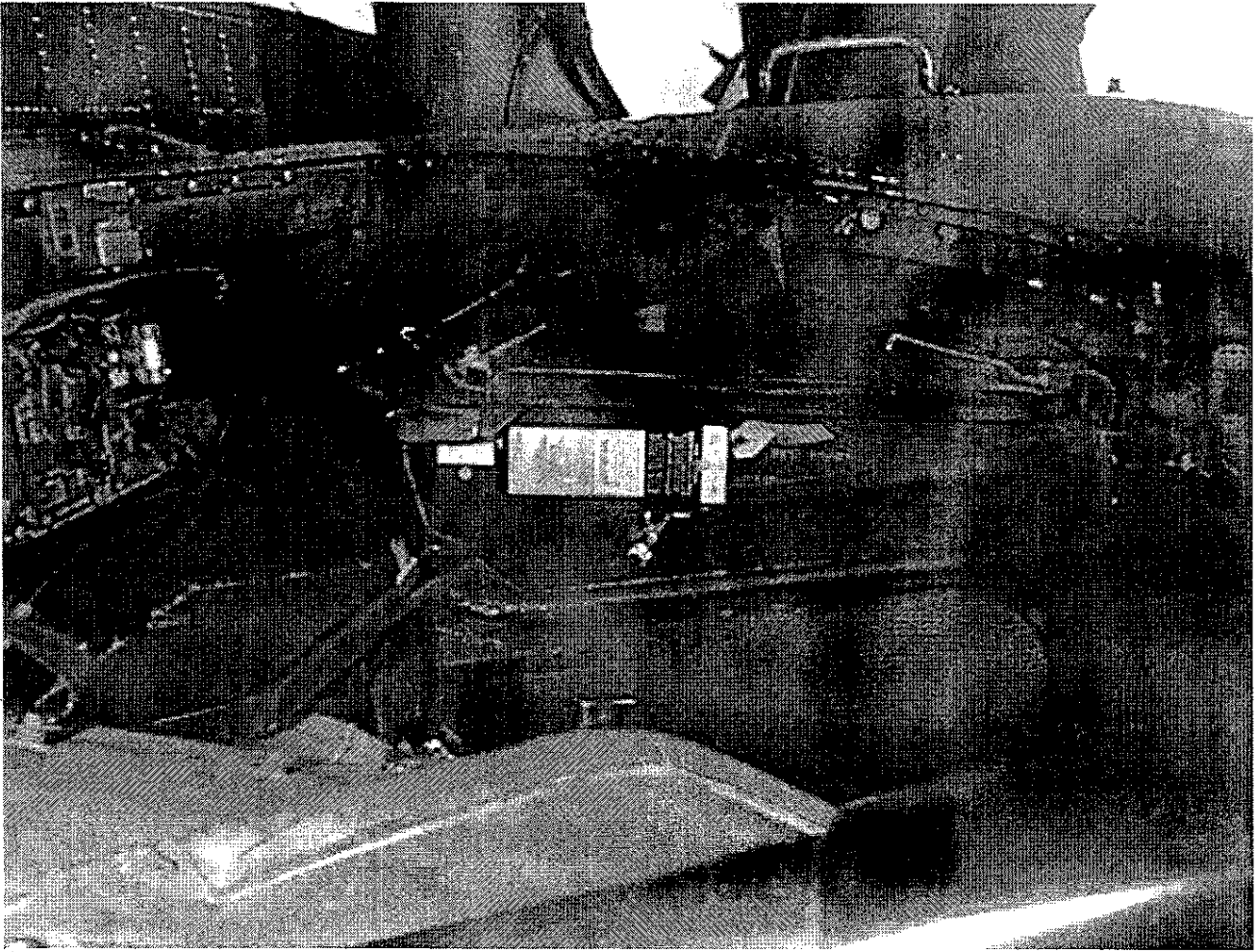


Figure 222. Group 02 Fairing Installation, Sensor Surveying Unit Mount (Copilot/Gunner)
7-311180080-17

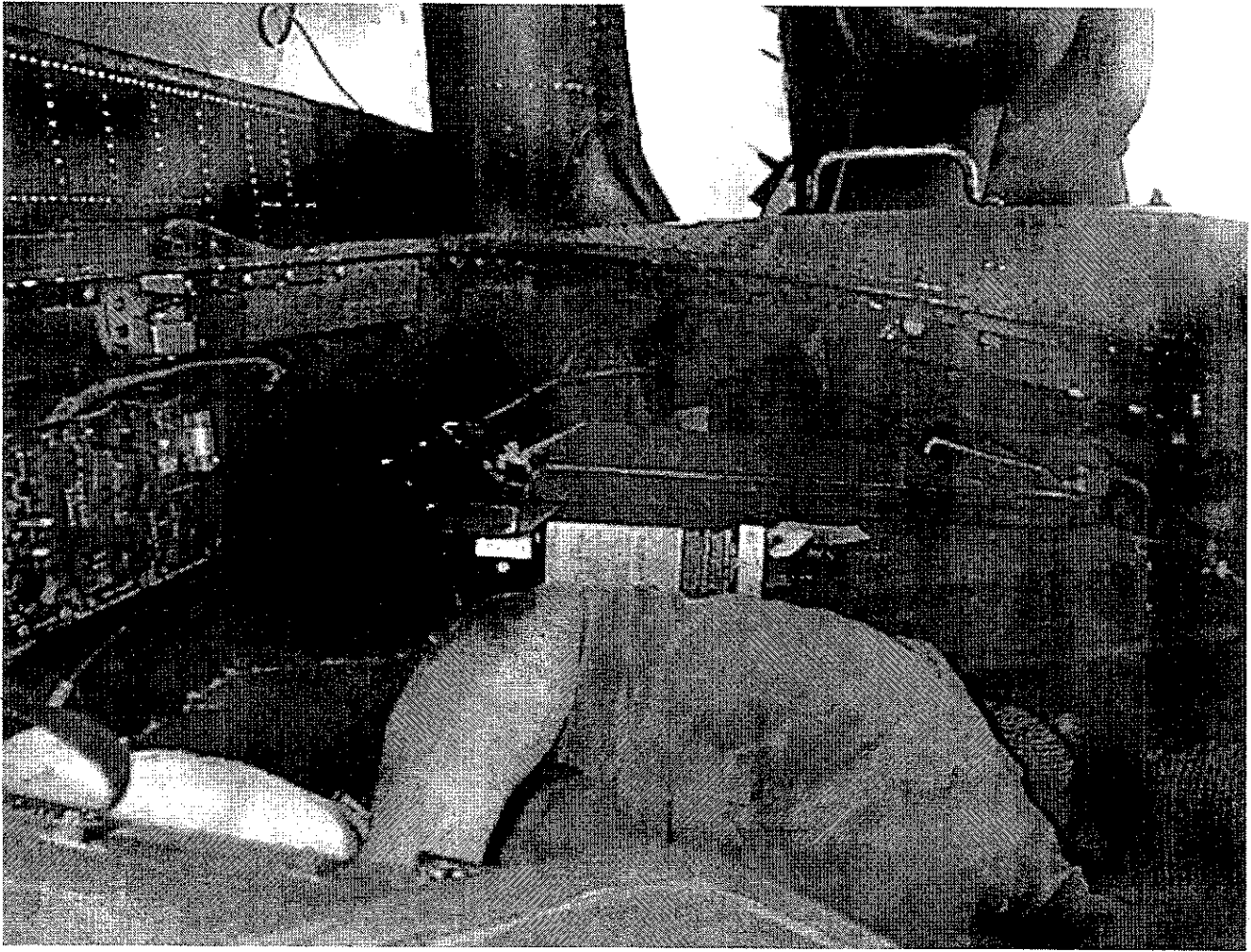


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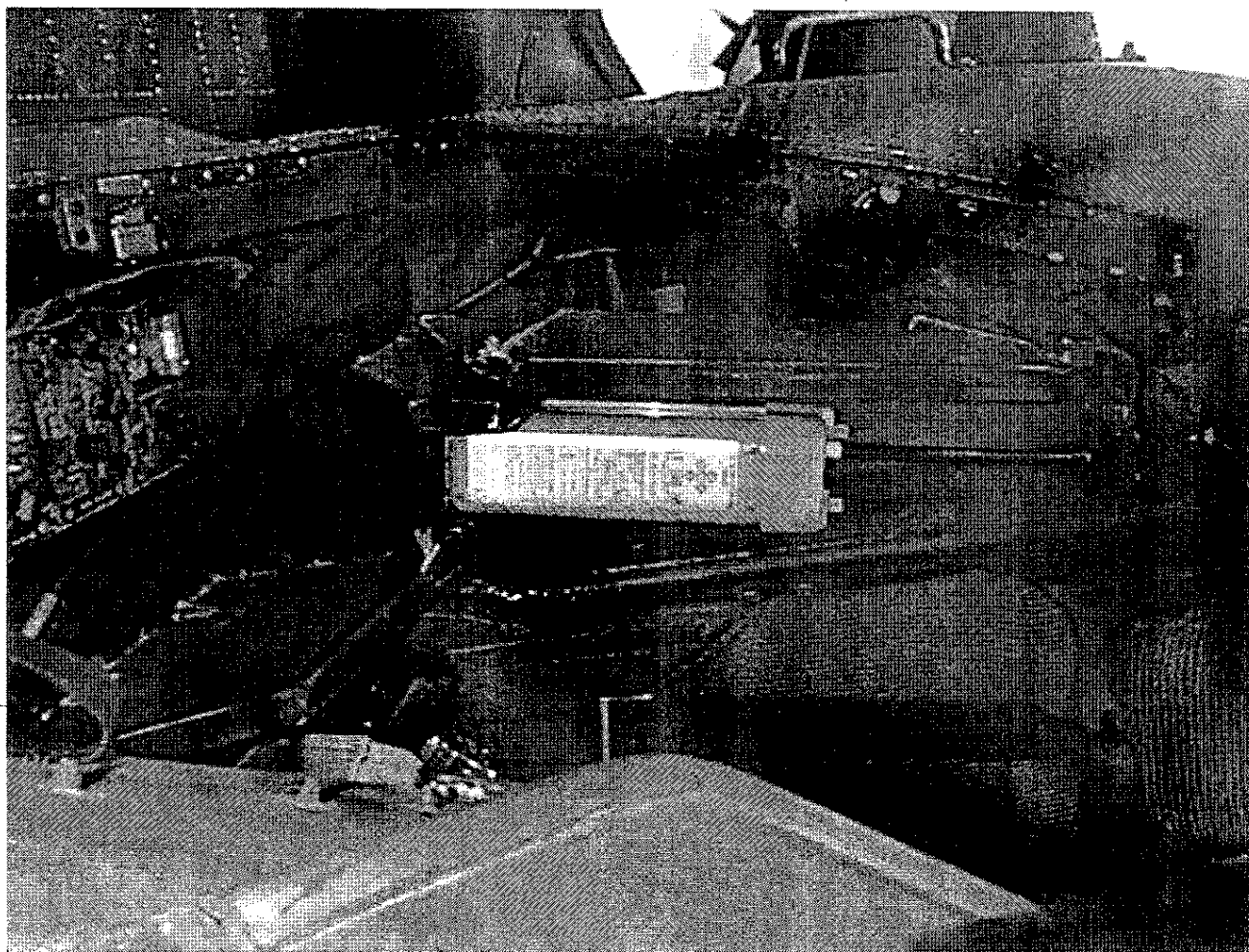
Figure 210. Group 02 Seat, Armored/Cushion (Wing Panels, Cushions and Bucket) (Norton)
251636-1 (44197)



Sheet 5



Sheet 6



Sheet 7



Sheet 8

ELT EMI/EMC TESTING INSTRUCTIONS

Enclosure 2

ELT EMI/EMC GROUND AND FLIGHT TESTING PROCEDURES

1. ELT EMI/EMC GROUND TESTING PROCEDURES:

- a. Notify the nearest Federal Aviation Administration (FAA) facility of the nature, date, and time of test to be performed.
- b. At the designated date and time of test, turn aircraft ELT ON.
- c. Perform functional checks for normal operation of equipment listed in the subsequent EMI/EMC checklist for your particular aircraft during engine start-up, while engine is running, and during engine shut-down.
- d. Turn ELT signal off by first toggling the switch to OFF/TEST and then to the AUTO/ARM position.
- e. Any equipment discrepancies noted due to ELT operation should be immediately referred to the respective aircraft engineering office at USA AMCOM:

<u>AIRCRAFT</u>	<u>POINT OF CONTACT</u>	<u>DSN</u>	<u>COMMERCIAL</u>
A/MH-6	Mr. Jesse Gambee	897-4811	(256) 313-4811
OH-58A/C	Mr. Skip Jackson	645-9625	(256) 955-9625
OH-58D	Mr. Eugene Mergel	788-0973	(256) 842-0973
AH-1	Ms. Denise Bouchard	645-9736	(256) 955-9736
AH-64A	Mr. Ananta Tosh	897-4805	(256) 313-4805
UH-1	Mr. Steve Monaco	645-0078	(256) 955-0078
EH/UH-60	Mr. Jay Merkel	645-0750	(256) 955-0750
CH-47	Mr. Larry Wieschhaus	897-4296	(256) 313-4296
Fixed Wing	Mr. Paul Lutz	645-0841	(256) 955-0841
Safety	Mr. Robert D. Brock	788-8632	(256) 842-8632
Mission Equipment	Mr. Lewis Williams	897-4867	(256) 313-4867

2. ELT EMI/EMC FLIGHT TESTING PROCEDURES:

- a. Notify the nearest FAA facility of the nature, date, and time of test to be performed.
- b. Complete normal procedures of aircraft start-up.
- c. Execute normal take-off procedures and assume a safe altitude of at least 3,000 feet.

d. At a designated date and time of test, turn aircraft
ELT ON.

e. Perform functional checks for normal operation of
equipment listed in the subsequent EMI/EMC checklist for
your particular aircraft during flight.

f. Land the aircraft.

g. Turn ELT OFF by first toggling the switch to
OFF/TEST and then to the AUTO/ARM position.

h. Any equipment discrepancies noted due to ELT
operation should be immediately referred to the respective
aircraft engineering office at USA AMCOM (see paragraph 1e).

ELT CHECK PROCEDURES

Enclosure 3

ELT CHECK PROCEDURES

1. Before engine start-up (or when Very High Frequency (VHF) initially switched ON):
 - a. Set aircraft transceiver to 121.5 MHz, 243 MHz, or Monitor Guard.
 - b. Listen for ELT warble tone.
 - c. If ELT warble tone is heard: Check ELT in your aircraft and ensure that ELT is turned OFF.
 - d. If warble tone is heard and ELT in your aircraft is activated: Turn ELT OFF by first toggling the switch to OFF/TEST and then to the AUTO/ARM position. Advise the control tower to notify the nearest FAA facility that ELT was activated.
 - e. If warble tone is heard and ELT in your aircraft is not activated: Advise control tower to notify the nearest FAA facility that ELT tone had been observed (see NOTE).
2. Before avionics shut-down:
 - a. Set aircraft transceiver to 121.5 MHz, 243 MHz, or Monitor Guard.
 - b. Listen for ELT warble tone.
 - c. If ELT warble tone is heard: Check ELT in your aircraft and ensure that ELT is not activated by first toggling the switch to OFF/TEST and then to the AUTO/ARM position.
 - d. If warble tone is heard and ELT in your aircraft is activated: Deactivate ELT by first toggling the switch to OFF/TEST and then to the AUTO/ARM position. Advise the control tower to notify the nearest FAA facility that ELT was activated.
 - e. If warble tone is heard and ELT in your aircraft is not activated: Advise the control tower to notify the nearest FAA facility that ELT tone has been observed (see NOTE).

NOTE

If your ELT activates in-flight due to an abrupt, uncontrolled flight maneuver (i.e., abrupt maneuver caused from failing flight control systems), ELT warble tone transmissions on guard frequencies (121.5 MHz or 243 MHz) will interfere with verbal messages transmitted or received on these frequencies. Consequently, verbal transmissions on guard frequencies will not be received if the ELT is activated aboard the same aircraft that is attempting to verbally transmit on guard frequencies. In addition, the ELT may interfere with cockpit communications if the radios are set to receive on guard frequencies; therefore, if an abrupt, uncontrolled flight maneuver causes the ELT to activate, the flight crew must:

a. Not attempt to transmit mayday calls on guard frequencies in the presence of ELT signals.

b. Switch the interphone or intercommunication receiver selector switches to the "OFF" position and the transmitter selector switch to the "ICS" or "INT" position. This procedure prevents the ELT signal from interfering with crew communication and enables the ELT to continue transmitting in the event of an accident.

c. Manually reset the ELT to prevent further transmission of the signal on guard frequencies during flight ONLY if the flight crew is capable of recovering from the abrupt, uncontrolled flight maneuver and continue controlled flight. Landing the aircraft may be required to locate and reset the ELT.

d. Immediately report any in-flight ELT activation and the type of ELT to the Directorate for Aviation Engineering at USA AMCOM.

WARNING

In the event of an emergency landing as a result of in-flight failure:

a. Ensure ELT is turned ON: NEVER switch ELT OFF.

b. Carry ELT with you when circumstances require all survivors to leave aircraft crash site.

NOTE

If a unit does not have procedures for observance of an activated ELT, the unit should follow the general procedures

for observance of an activated ELT outlined in the Search and Rescue Manual, FM 20-150.

MANUFACTURERS DATA SHEETS

Enclosure 4

model EBC 302HM

Military

EMERGENCY LOCATOR TRANSMITTER

Years of field experience by our pilot engineers have led to the development of the EBC 302HM series, ELTs especially adapted for the military. Our engineers used the EBC 302H design with its unique 360° spherical 6-axis G-switch system as the basis for these ruggedized military models. The EBC 302HM incorporates a flat black, non-infrared reflective finish which allows cockpit mounting even when night vision goggles are in use. The antenna assembly has been strengthened beyond what is normally required for civil aircraft so as to provide increased military survivability. Since military equipment is subjected to continuous periodic maintenance and handling while on the ground, false alarms due to handling can be very troublesome. The EBC 302HM additionally incorporates a shorting plug attached to the lanyard which disables the crash force sensor when inserted into the disabling jacks. Thus, maintenance can be performed without any worry of accidentally activating the ELT.

The EBC 302HM is also ideally suited for all military fixed wing aircraft thereby providing the military with a single universal unit designed for their special needs.

The EBC 302HM meets or exceeds the requirements of FAA TSO C-91 and is FCC Type Accepted under Part 87.

Manufactured by Glatzer Industries Corp.

SPECIFICATIONS

Range1200+ Miles
Range-Search AircraftLine of Sight
Operating lifeUp to 200 hrs
Operating Temperature-20° F to +160° F
Battery Type and Shelf Life.....Alkaline/4 years
Frequency121.5 MHz and 243.0 MHz simultaneously
Frequency Stability+ .005%
Power.....75mW Perf on each frequency after 48 hours
ModulationSwept Tone 1600 Hz to 300 Hz 2-4 times per second.
ShockWithstands up to 1000 G's
WaterproofWithstands 20 hrs. complete submersion in salt water

SPECIAL FEATURES

True 360 degree spherical G-Switch.
Shorting Plug on lanyard to disable G-Switch.
Night vision goggle compatible.
Solid state circuitry is encapsulated for complete waterproofing and shock resistance.
Comes complete with hand-hold lanyard, mounting bracket and batteries.
Built-in test light for checking power output, modulation, and battery.
Easily installed - no external antenna or cabling required.
Fire resistant.

PHYSICAL

Size: 2 1/2"W X 2"D x 6 1/2"H
Weight. 1.8 lbs
Case: Aluminum
Finish: Flat Black Baked Enamel
True 360° spherical G-Switch
Night vision goggle compatible
Built-in test light for checking power output, modulation, and battery.
Fire resistant
Beefed-up Flexible Non-Telescoping Antenna extends 19" above top of case
Solid state circuitry encapsulated in plastic for complete water-proofing and shock resistance.
Comes with hand-hold lanyard and mounting kit.
Emergency Beacon Corp. 15 RIVER STREET, NEW ROCHELLE, NEW YORK 10801 (914) 235-9400

model EBC 502HM

Military

EMERGENCY LOCATOR TRANSMITTER

The EBC 502HM series adapts all the ingenious characteristics of the EBC 502 to the special needs of helicopters. It has FAA TSO-C91a approval. Designed to be mounted within reach of the pilot, co-pilot or crew, the EBC 502HM meets the increased survivability needs of the helicopter environment. This ELT has also been enhanced to survive the special conditions faced by the military. As with all EBC ELTs, its electronic and activation systems are completely encapsulated for increased protection against shock and moisture, and extra protection is provided for the crystal. Its true 360 degree spherical 6-axis G-switch design makes it specially equipped to tackle the problems unique to helicopter flight, for when a chopper goes down, it can go down in any number of directions, making the ordinary single axis G-switch inadequate. The EBC 502HM incorporates a flat black, non-infrared reflective finish which allows cockpit mounting even when night vision goggles are in use. The antenna assembly has been strengthened beyond what is normally required for civil aircraft so as to provide increased military survivability. Since military equipment is subjected to continuous periodic maintenance and handling while on the ground, false alarms due to handling can be very troublesome. The EBC 502HM additionally incorporates a shorting plug attached to the lanyard which disables the crash force sensor when inserted into the disabling jacks. Thus, maintenance can be performed without any worry of accidentally activating the ELT.

Manufactured by Glatzer Industries Corp.

SPECIFICATIONS

Range1200+ Miles
Range-Search AircraftLine of Sight
Operating lifeMore than 48 hrs
Operating Temperature-20° C to +55°C
Battery Type and Shelf Life.....Alkaline/4 years
Frequency121.5 MHz and 243.0 MHz simultaneously
Frequency Stability+.005%
ModulationSwept Tone 1600 Hz to 300 Hz 2-4 times per second.
Modulation Duty Cycle33% min., 55% max
Modulation Percentage100%
Peak Effective Radiated Power.....minimum 50mW for 50 hours at -20°C
Automatic Activation.....360°
Altitude50,000 ft.
Decompression8000 ft. to 40,000 ft.
High Pressure-15,000 ft.
Humidity95%, 50 hours
Shock Performance.....1000+ G's, 6 axis
Vibration10 G's
ImmersionWithstands 24 hours in salt water

PHYSICAL

Size: 2 1/2"W X 2"D x 8 1/2"H
Weigh: 2.75 lbs
Case: Aluminum
Finish: Flat Black, non-infrared reflective
Antenna: Flexible, stainless steel whip extends 19 inches above the top of the unit

Emergency Beacon Corp. 15 RIVER STREET, NEW ROCHELLE, NEW YORK 10802 (914) 235-9400

DM 8 (P/N 261D1380-020) OMNIDIRECTIONAL ACTIVATION
EMERGENCY LOCATOR TRANSMITTER SYSTEM
INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS

CAUTION

This document pertains only to the DM ELT 8.5 Omnidirectional Activation Transmitter.

INTRODUCTION

The DM ELT 8 is a rugged, reliable Emergency Locator Transmitter System designed and manufactured with the highest standards of quality to assure the aircraft operator maximum emergency protection. The DM ELT 8.5 Omnidirectional Activation Transmitter consists of a DM ELT 8.1 transmitter and a DM DS1-1 omnidirectional activation sensor (see Fig.2).

The DM ELT 8.5 Omnidirectional Activation Transmitter transmits distress signals in aviation emergencies at 121.5 and 243.0 MHz. It is designed to activate automatically and no preliminary procedures other than proper installation and periodic operational testing are required.

The unit is designed to automatically activate in the event of a crash, and is able to sense crash impulse forces from any direction (spherical coverage). The unique omnidirectional activation characteristics of the DM ELT 8.5 Omnidirectional activation Transmitter makes it ideal for helicopter installation.

In addition to the automatic operation, the DM ELT 8.5 may be operated manually to summon assistance in the event of a remote area landing. A remote control is also available to provide the ability to control the ELT operation at the instrument panel. The digital logic included in the remote control design provides a totally failsafe operation to insure that the ELT will continue transmitting after either automatic or remote control activation even if the interface wiring between the transmitter and the remote control is damaged or shorted to the airframe during an aircraft crash.

These instructions provide the installation, operation, and maintenance procedures for the DM ELT 8 Omnidirectional Emergency Locator Transmitter System. The installation is designed for simplicity; appropriate FAA directives should be followed. It is recommended that all information contained herein be reviewed completely prior to system installation.

CAUTION

The DM ELT 8 transmitter system has been designed, qualified and approved with the options specified herein. Any modifications of the unit not specifically defined in this document will void FAA/DOT approval and Dorne & Margolin warranty.

The following items are contained in the standard DM ELT 8 Omnidirectional Transmitter System (system p/n 261D1380-020) package:

- DM ELT 8.5 Omnidirectional Transmitter (Fig 1)
- DM ELT 8.2 Flexible Antenna (Fig 4)
- DM ELT 8.3 R.F. Matching Cable (Fig 4)

Optional Equipment includes:

- *DM ELT 8.4 79" R.F. cable for use with the DM ELT 8.2 flexible antenna
- *DM Q18-3 High Performance aircraft antenna
- *DM U60-1 49" R.F. cable for use with the DM Q18-3 antenna (Fig 5)
- *DM U60-2 120" R.F. cable for use with the DM Q18-3 antenna
- *DM U106-1 Remote control switch (Fig 3)

*The DM ELT 8.3 and DM ELT 8.4 R.F. cables are not interchangeable with the DM U60-1 and DM U60-2 cables.

CAUTION

Before installing any of the system components, insure that the cable supplied with the system will reach between the intended transmitter installation location and antenna location. If not, utilize the optional cable as applicable for the specific antenna type.

TRANSMITTER INSTALLATION (Fig 2)

The DM ELT 8.5 transmitter module should be mounted as close to the aircraft center of gravity as possible to reduce the requirement for the addition of counter balance weight. It is recommended that the transmitter be mounted in the aft cockpit area to increase the ELT survivability in the event of a crash.

The installation should be made to a structural member or must be made as close to a structural member as possible to minimize the effects of aircraft skin resonances which might result in inadvertent transmitter activation. The

transmitter installation location should provide easy access to the transmitter controls unless a DM U106-1 remote control switch is included in the installation.

1. An unobstructed area of 4 by 15 inches should be selected for easy access and installation. The selected location must be hard mounted to the aircraft structure and not to flexible type panels or shelves. Due to the spherical activation sensitivity, the transmitter module may be mounted in any orientation. It is recommended that the transmitter be mounted with "DIRECTION OF FLIGHT" arrow facing in a forward direction.
2. Locate three 0.234 inch diameter holes on the selected mounting surface. Holes should be spaced as shown in Fig 2. The holes are sized to accept #10 hardware.
3. Place the DM ELT 8.5 on the mounting holes with the "DIRECTION OF FLIGHT" arrow facing forward and assemble to the mounting surface with #10-32 stainless steel hardware using lockwashers and nut (not supplied).

CAUTION

Canadian Installations - Do not install the DM ELT 8.5 in a pressurized cabin without proper consultation with your regional DOT office. The installation must be performed in accordance with the DOT Engineering and Inspection Manual.

ANTENNA INSTALLATION

NOTE

Mounting Requirements - Aircraft with a non-metallic mounting surface must add a metal ground plane with a 9 inch minimum radius for antenna mounting. This can be as simple as aluminum foil cemented inside a wood or stiff fiberglass skin, or a doubler plate on a fabric covered aircraft. The ground plane should either be well bonded to the airframe, or well insulated from it, to prevent noise problems or erratic operation. Antenna mounting hardware must electrically connect the ground plane to the antenna.

FLEXIBLE ANTENNA INSTALLATION (Fig 4)

The DM ELT 8.2 external antenna should be mounted on top of the fuselage to the aft of the main rotor driveshaft.

1. Use a 17/32 drill to open up a 0.531 inch hole in the aircraft skin.
2. Remove nut and star washer from antenna.
3. Install antenna assembly into drilled hole.
4. Fasten antenna to aircraft skin with star washer and nut supplied with the DM ELT 8.2 antenna.
5. Interconnect the DM ELT 8.2 antenna to the DM ELT 8.5 transmitter using the DM ELT 8.3 or DM ELT 8.4 R.F. cable.
6. Set ON/OFF/AUTO switch on the DM ELT 8.5 transmitter to AUTO.
7. Perform Operational Test in accordance with the procedure following the High Performance Antenna Installation section.

HIGH PERFORMANCE ANTENNA INSTALLATION (Fig5) (Optional)

1. Use the doubler plate supplied with the DM Q18-3 antenna as a template and mark aircraft skin in accordance with mounting hole pattern.
2. Drill on 0.562 (9/16) inch diameter hole for the connector.
3. Drill four 0.189 inch diameter (#12 drill) holes in accordance with the mounting hole pattern.
4. Place DM Q18-3 on outer surface of aircraft skin with rubber gasket between antenna and mounting surface. Install metal doubler plate (supplied with antenna) on the inside surface of the aircraft so that aircraft skin is sandwiched between doubler plate and antenna (with gasket). Install four #8-32 stainless steel flathead screws using lockwashers and nuts (nut supplied). Insure that either the doubler plate or antenna mounting surfaces contact a bare metal surface to insure good grounding.
5. Interconnect the DM Q18-3 antenna with the DM ELT 8.5 transmitter using the DM U60-1 or DM U60-2 R.F. cable.
6. Set the DM ELT 8.5 transmitter ON/OFF/AUTO switch to the AUTO position.
7. Perform Operational Test in accordance with the procedure following this section.

OPERATIONAL TESTS

NOTE

According to FAA regulations, the DM ELT 6.13, the DM ELT 8.13 battery pack and the DM U105-1 battery must be replaced if the unit has been transmitting for more than one (1) continuous hour.

An operational test must be performed upon completion of the entire DM ELT 8 system installation. The aircraft operator should be present to learn the location and operation, and what the ELT sounds like.

The FAA/DOT allows free space transmission tests from the aircraft anytime within five minutes after each hour. The test time allowed is generally three sweeps of the warble tone, or approximately a one second test. The control tower should be notified that a test is about to be performed.

Set the aircraft VHF-AM transceiver to 121.5 MHz. Set the ELT ON/OFF/AUTO switch to the ON position. The DM ELT 8 will be heard immediately. After one second test period is completed, set the ELT ON/OFF/AUTO switch to the AUTO position.

The functional test is recommended on installation, and before every flight. As a minimum it should be performed periodically every 100 flight hours or three months, whichever comes first.

OPERATION

The operator should be completely familiar with the Emergency Locator Transmitter characteristics and operating procedures.

The DM ELT 8 is a self-contained, battery operated emergency transmitter that requires minimal service and is designed to activate automatically if an impact occurs. There are no last minute in-flight emergency procedures required to activate the DM ELT 8.

AUTOMATIC OPERATION

The ELT must be set in the AUTO position at all times while the aircraft is operational. The unit will activate automatically when subjected to a crash impact that exceeds the activation switch threshold level. Due to the omnidirectional crash force sensor characteristics, the ELT will activate when subjected to a crash force from any direction.

MANUAL OPERATION

NOTE

Manually operate the ELT only when:

- a. The operator elects to do so.
 - b. A "soft" crash does not activate the ELT.
-

To activate the DM ELT 8:

1. Set the ELT ON/OFF/AUTO switch to ON position,

OR

2. If remote control equipped, set Remote Control toggle switch to the ACTIVATE position.

REMOTE OPERATION (Fig 3) (Optional)

1. Set the ON/OFF/AUTO switch on the DM ELT 8.5 transmitter to AUTO. The transmitter can be operated remotely only with the switch in AUTO.
2. Operate the Remote Control (DM U106-1) as described in the Remote Control Operating Instructions #3004.

MAINTENANCE

The DM ELT 8 system is non-field repairable. For service other than battery replacement, send the unit to Dorne & Margolin, Inc.

BATTERY PACK INSPECTION

The DM ELT 8.5 transmitter is powered by the DM U105-1 and either the DM ELT 6.13 battery pack or the DM ELT 8.13 battery pack. The construction of these batteries have been selected for their long life and low temperature operating capabilities. To insure that the DM ELT 8.5 transmitter will operate properly in an emergency, it is recommended that a visual inspection for leaks in the battery compartment be performed every three months.

BATTERY PACK REPLACEMENT

The battery packs are simple to replace by carefully following the instructions included with the DM ELT 6.13,

DM ELT 8.13 or DM U105-1 replacement batteries. The required battery replacement dates are stamped on the DM ELT 8.5 transmitter and the DM DS1-1 omnidirectional sensor.

NOTE

1. It is recommended that the DM U105-1 battery be replaced at the same time that the DM ELT 6.13 or DM ELT 8.13 battery is replaced (unless the replacement date on the DM U105-1 requires replacement sooner).
2. The use of any battery pack other than that manufactured by Dorne & Margolin will automatically void the Dorne & Margolin warranty on that particular unit.

REMOTE CONTROL SWITCH INSTALLATION

The DM U106-1 remote control switch provides the operator with the ability to:

1. Turn the ELT ON for testing or for emergency operation.
2. Reset the ELT to AUTO (armed) in the event of inadvertent activation.

Installation and operation of the remote control switch is simple by carefully following the installation and operation instructions included with the DM U106-1 Remote Control Panel.

ARTEX AIRCRAFT SUPPLIES**DOCUMENT # 570-1015**

ELECTRICAL CHARACTERISTICS	121.5/243.0 MHz
OPERATING FREQUENCIES	121.5 & 243.0 MHz +/- 0.005%
MODULATION DUTY CYCLE	33% MIN, 55% MAX
TRANSMITTER DUTY CYCLE	CONTINUOUS
PEAK EFFECTIVE RADIATED POWER (PERP)	Minimum 50mW (17dBm) for 50 hours at -20C and + 55C
OCCUPIED BANDWIDTH	25 KHz Maximum
OPERATING TEMPERATURE	-20C TO + 55C
AUTOMATIC ACTIVATION FOR ELT 110-4, 110-6 & 100HM	VELOCITY CHANGE OF 3.5 FI/SECOND
AUXILIARY G-SWITCH ACTIVATION FOR ELT-100HM	5 AUXILIARY G-SWITCHES ACTIVATE AT 12 G's IN ADDITION TO THE MAIN G-SWITCH
ENVIRONMENTAL CHARACTERISTICS	121.5/243.0 MHz
TEMP (STORAGE)	-55°C TO + 85°C
TEMP (OPERATING)	-20°C TO + 55°C
ALTITUDE	55,000 FEET
VIBRATION	10Gs, 5Hz TO 2,000Hz
SHOCK TEST	500Gs FOR 4 mSec
CRASHWORTHINESS	100Gs FOR 23 mSec

ARTEX AIRCRAFT SUPPLIES**DOCUMENT # 570-1015**

HUMIDITY	95% FOR 50 HOURS
PENETRATOR DROP	55 LBS FROM 6 INCHES
CRUSH TEST	1,000 LBS
SPURIOUS EMISSIONS	AS PER CFR TITLE 47 (FCC) PART 87
ANTENNA	121.5/243.0 MHz
TYPE	VERTICAL MONOPOLE
RADIATION PATTERN	OMNIDIRECTIONAL
IMPEDANCE	50 OHMS NOMINAL AT 121.5 AND 243.0 MHz
OPERATING SPEED (AT SEA LEVEL)	110-324: 300 KNOTS 110-318: 350 KNOTS 110-330: 345 KNOTS 110-328-01: MACH 1
CABLE	RG-58 WITH BNC CONNECTORS
WEIGHTS	
ELT UNIT ELT 110-4 & 100HM ELT 110-6	3 LB 7.4 OZ. 3 LB 9.5 OZ.
MOUNTING TRAY	7.4 OZ.
END CAP	3.7 OZ.
ANTENNA 110-324 110-318 110-330 110-328-01	2.0 OZ. 5.5 OZ. 12.0 OZ. MAXIMUM 1 LB 3.2 OZ. MAXIMUM

ARTEX AIRCRAFT SUPPLIES**DOCUMENT #570-1015**

MEASUREMENTS	
ELT UNIT	10.4" L x 3.1" H x 3.1" W
ELT WITH MOUNTING TRAY AND END CAP INSTALLED	11.74" L x 3.65" H x 3.82" W
ANTENNA 110-324	18.25" (BASE-TO-TIP HEIGHT)
110-318	13.75" (BASE-TO-TIP HEIGHT)
110-330	13.00" (BASE-TO-TIP HEIGHT)
110-328-01	09.00" (BASE-TO-TIP HEIGHT)
BATTERY SPECIFICATIONS	
TYPE OF CELL	ALKALINE-MANGANESE DIOXIDE
VOLTAGE	9.0 VOLTS
AMP HOUR RATING	6.0 AMP/HOURS
REPLACEMENT BATTERY PACK	PART NUMBER:
ELT 110-4	452-0130
ELT 110-6 & 100HM	452-0130-02

**APPROVED BATTERIES AVAILABLE FROM ARTEX OR ANY
DEALER**

ARTEX AIRCRAFT SUPPLIES, INC.

10714 SOUTH TOWNSHIP ROAD

P.O. BOX 1270

CANBY, OREGON 97013

TEL (503)-266-3959, (800)-547-8901. FAX (503)-266-3362

1.1. SYSTEM DESCRIPTION

The ARTEX ELT 110-4, 110-6 AND 100HM are "second generation" ELT's transmitting on 121.5 and 243.0 MHz. The ELT is designed to meet or exceed the requirements of TSO C91a and the mandatory automatic ELT requirements of FAR Part 91. The ELT meets the requirements of Canadian DOT Aviation Regulations per E&I Manual Part 2, Chapter 3, Section 3.

The ELT automatically activates during a crash and transmits the standard swept tone on 121.5 and 243.0 MHz.

A blinking light on the cockpit remote switch panel and an optional buzzer alert you when the ELT is active. The switch below the cockpit panel light allows you to turn the unit on for testing and to reset the unit. You cannot "disarm" or disable the unit from the cockpit. Cockpit operation is limited to deactivating the ELT after it has been activated, or manually activating the ELT.

The ELT is housed in a high impact fire resistant polycarbonate plastic case. The ELT unit is able to withstand extremely harsh environments. Units, exactly like yours, have been subjected to numerous 500g shock pulses, 1000 pound crush weights and severe penetrator tests, and continue to operate normally. Continued operation in a temperature range of -20° C through + 55° C is assured.

1.1.1. LINE REPLACEMENT UNITS (LRU)

The ELT 110/100HM series system consists of the following components:

ELT Unit

- a. G-Switch
- b. Transmitter
- c. Microprocessor
- d. Miscellaneous components
- e. "ON" Light

Battery Pack

Fixed Antenna

Connecting Coax Cable

Mounting Tray

Mounting Tray End Cap

Cockpit Remote Switch Assembly

Buzzer (optional)

Installation Kit

1.2. TRANSMITTER CHARACTERISTICS

The PCA contains a one time programmable microprocessor that controls all the ELT functions (ON/OFF, modulation, and RESET).

The transmitter operates simultaneously on 121.5 and 243.0 MHz with the carrier frequencies remaining within 0.005% under all environmental operating conditions.

1.2.1. 121.5/243.0 MHz TRANSMITTER

The AM modulation at 121.5 and 243.0 MHz is designated as A9 with the carrier amplitude modulated with an audio frequency sweeping downward over a range of not less than 700 Hz, within the range of 1,600 to 300 Hz. The sweep repetition rate is between 2 and 4 Hz with a modulation factor of at least 0.85. The modulation applied to the carrier frequency has a minimum duty cycle of 33% and a maximum duty cycle of 55%.

The power output at 121.5 and 243.0 MHz will not be less than 17 dBm (50mW) during the 50 hour operational period at both -20 degrees Centigrade and + 55 degrees Centigrade. The nominal power output at 121.5 MHz with a fresh battery (9.5 volts) is 100 mW (20dBm).

1.3. FCC REQUIREMENTS

The ELT shall maintain a frequency stability of 50 parts per million on 121.5 and 243.0 MHz. This allows a variation of plus or minus 6.075 KHz at 121.5 MHz.

On any frequency removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth the power is to be attenuated at least 25 dB.

On any frequency removed from the assigned frequency by more than 100 percent up to and including 250 percent of authorized bandwidth the power is to be attenuated at least 35 dB.

On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth the power is to be attenuated at least 40 dB.

1.4. TSO REQUIREMENTS

To gain TSO approval of a 121.5/ 243.0 MHz ELT it is necessary to meet the requirements of TSO C91a. The following sections contain descriptions of components necessary to meet TSO C91a with the ARTEX ELT 110-4, 110-6 and 100HM.

1.4.1. ACTIVATION MONITOR

An aural and/or visual monitor is provided to alert the pilot when the ELT has been activated and is transmitting.

The following requirements apply to the activation monitors:

a. Aural Monitor - The aural monitor provides a distinct signal enabling a search and rescue team to locate an aircraft with a transmitting ELT in a confined area with a large number of aircraft (i.e. such as an airport). The search and rescue team would listen for the aural monitor and easily locate and disable the offending ELT without a great deal of effort.

b. Visual Monitor - The visual monitor is designed to be installed so that it can be viewed from the pilot's position. Its intended function is to inform the pilot that the ELT is transmitting, avoiding a situation where an aircraft is flying with its ELT transmitting.

1.4.2. G-SWITCH

The crash force activation sensor or G-Switch is designed to activate with a change of velocity of 3.5 fps \pm 0.5 fps both under normal conditions and while being subjected to 30 G's of cross axis forces. Figure 1-1 shows the plot of time versus G Force that the G-Switch must be qualified to in order to meet TSO C91a approval criteria.

The ELT-100HM has an additional five G-Switches providing for six axes activation coverage. The additional five G-Switches activate at a G force of 12 G's.

1.4.3. BATTERY PACK

The Battery Pack for the ELT 110/100HM series consists of six 1.5 vdc "D" size Alkaline-Manganese Dioxide cells connected in series.

1.4.4. REMOTE CONTROL

The ELT 110/100HM series remote control (cockpit panel switch) provides "MANUAL ON," "ARMED," and "RE-SET" modes. The remote control wiring between the control and the ELT is designed so that no combination of short circuits between the remote control, monitor(s), associated wiring and the airframe will:

- Inhibit the equipment from being automatically activated.

- Deactivate the ELT after it has been activated.
- Result in additional power drain so that the ELT will not meet the minimum PERP (17 dBm) through the 50 hour operation period at any of the specified operating temperatures (-20°C to $+55^{\circ}\text{C}$).

1.5. ARTEX Antennas

ARTEX provides a variety of antenna's designed to work with the 110/100HM series ELT's. They include a standard whip antenna, two types of rod antennas and a blade antenna.

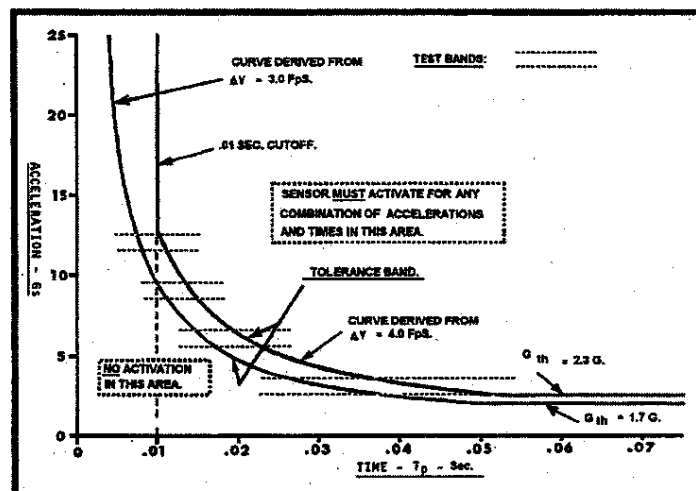


FIGURE 1-1 G-SWITCH CURVE

1.5.1. Standard Whip Antenna

The 110-324 Whip Antenna is intended for lower speed aircraft that do not exceed 300 knots. This antenna is not recommended for helicopter installations. See Figure 1-2.

110-324 SPECIFICATIONS

- Freq: 121.5 and 243.0 MHz
- VSWR: 2.0:1 Max
- Polarization: Vertical
- Radiation Pattern: Omnidirectional
- Airspeed Rating: 300 Knots TAS at sea level
- Connector: BNC

1.5.2. Rod Antenna

The 110-318 and 110-330 Rod Antennas are intended for lower speed aircraft that do not exceed 350 knots and 345 knots respectively. See Figures 1-3 and 1-4.

110-318 SPECIFICATIONS

- Freq: 121.5 and 243.0 MHz
- VSWR: 3.0:1 Max.
- Polarization: Vertical
- Radiation Pattern: Omnidirectional
- Airspeed Rating: 350 Knots TAS at sea level
- Connector: BNC

110-330 SPECIFICATIONS

- Freq: 121.5 and 243.0 MHz
- VSWR: less than 2.5:1 @ 121.5 and less than 2.0:1 @ 243.0 MHz
- Polarization: Vertical
- Radiation Pattern: Omnidirectional
- Airspeed Rating: 345 Knots TAS at sea level
- Connector: BNC

1.5.3. Blade Antenna

The 110-328-01 Blade Antenna is intended for higher speed aircraft that do not exceed Mach 1. See Figure 1-5. [Note: TNC connector not used].

110-328-01 SPECIFICATIONS

- Freq: 121.5, 243.0 MHz
- VSWR: 2.0:1 Max.
- Polarization: Vertical
- Radiation Pattern: Omnidirectional
- Airspeed Rating: Mach 1 TAS at sea level
- Connectors: BNC & TNC.



REPLY TO
ATTENTION OF

AMSAM-RD-AE-I


DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA 35898-5000

4 November 2002

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Modification to Airworthiness Release for Emergency Locator Transmitter (ELT) Installation on All US Army Aircraft Incorporating ELTs

1. Reference memorandum, HQ USAAMCOM, AMSAM-RD-AE-I, 17 December 1999, subject: Airworthiness Release for Emergency Locator Transmitter (ELT) Installation and Testing Procedures on All U.S. Army Aircraft Incorporating ELTs.
2. This memorandum modifies referenced memorandum issued in accordance with (IAW) Army Regulation (AR) 70-62, for the purpose of updating referenced memorandum to include authorization for installation of Electron Beacon Corporation (EBC) Models 302HM and 502HM; and the ARTEX 100HM on AH-64D Longbow Apache Helicopters. AH-64A Apache Helicopter directions apply as a reference for installation, operations, inspections, and reporting for all AH-64D Longbow Apache Helicopter ELT installations. For AH-64D refer to Interactive Electronic Technical Manual instead of the Technical Manual.
3. This memorandum shall be attached to, and become part of referenced memorandum until such time that it is incorporated in a revised Airworthiness Release or is terminated.
4. The points of contact for this memorandum are Mr. Ananta Tosh, AMSAM-RD-AE-I-P-A, commercial (256) 705-9865, Mr. Lee Bumbicka, AMSAM-RD-AE-I-P-A, commercial (256) 705-9820, or Mr. Lon A. Stanger, AMSAM-RD-AE-I-P-R, commercial (256) 705-9861.


for DENNIS S. POWELSON
Director of Aviation Engineering

AMSAM-RD-AE-I

4 November 2002

SUBJECT: Modification to Airworthiness Release for Emergency Locator Transmitter (ELT)
Installation on All US Army Aircraft Incorporating ELTs

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1st Cavalry Division (AFVA-GD), Fort Hood, TX 76544-5101
Aviation Brigade, 1st Cavalry Division (AFVA-AB-CO), Fort Hood, TX 76544
21st Cavalry Brigade, S-4, Aviation Maintenance Section (Apache), Fort Hood, TX 76544-5085
1/227th Aviation Regiment (AFVA-1CD-4BCE-1-227-CMD), Fort Hood, TX 76544
Aviation Brigade, 101st Airborne Division, (AFKD-KF-CO), Aviation Maintenance Officer,
Fort Campbell, KY 42223-0094
2/101st Aviation Regiment (AFZB-KF-M-CO), Fort Campbell, KY 42223-5000
Aviation Training Brigade, US Army Aviation Center (ATZQ-ATB), Fort Rucker, AL 36362
US Army Aviation Technical Test Center (STEAT-MP-P), Fort Rucker, AL 36362-5276
Aviation Brigade, 3rd Infantry Division (AFZP-VX-C), Hunter Army Airfield, GA 31409-5100
1/3rd Aviation Regiment (AFZP-VXB-C), Hunter Army Airfield, GA 31409-5000
Eighth US Army (EAGC-EA), Unit 15236, APO AP 96208-0009
Aviation Brigade, 2d Infantry Division (EAID-AA-CO), Unit 15435, APO AP 96257-0481
1/2d Aviation Regiment (EAID-AH-CO), Unit 15008, APO AP 96208-0476
6th Squadron, 6th Cavalry (AETV-AV-CS) Fort Hood, TX 76545
6th Squadron, 6th Cavalry (AETV-AV-CS) CMR#416, APO AE 09140
1/101st Aviation Regiment (AFZB-KF-E-CO), Fort Campbell, KY 42223
1/4th Aviation Regiment (AFVB-AV-CO), Fort Hood, TX 76544
Defense Contract Management Agency, McDonnell Douglas Helicopter Systems,
(DCMDW-GPOM), 5000 McDowell Road, Mesa, AZ 85215-9797